Scroll Air Compressor Service and Maintenance

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Description

GENERAL

The Powerex Oilless Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oilless unit.

The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll air compressor .

The Powerex oilless rotary scroll air compressor is based on the theory of scroll compression. A scroll is a free standing, intricate spiral bounded on one side by a solid, flat plane or base. A scroll set, the basic compression element of a scroll compressor, is made up of two identical spirals which form right and left hand parts. One of these scroll components is indexed or phased 180° with respect to the other so the scrolls can mesh.

Crescent-shaped gas pockets are formed and bounded by the spirals and the base plate of both scrolls. As the moving scroll is orbited around the fixed scroll, the pockets formed by the meshed scrolls follow the spiral toward the center and diminish in size. The moving scroll is prevented from rotating during this process so the 180° phase relationship of the scrolls is maintained. The compressor's inlet is at the outer boundary of the scrolls. The compressed gas is discharged through the outlet at the center of the fixed scroll so no valves are needed.

Inlet Filter

2500 HOURS - MAINTENANCE

The inlet filter on the scroll compressor assures 99% particulate free air is admitted to the unit. Order P/N IP032901AV for both the 3 HP and 5HP units. Change every 2,500 hours or more often in dirty locations.

1. Remove filter cover by releasing spring clamps (See Figure 1).
2. Remove wing screw.

⚠CAUTION ***Do not attempt to clean filter . This filter requires replacement and is to be replaced when contaminated.***

3. Clean inlet plate, filter cover and six (6) silencer tubes using an air gun or by wiping dry with a cloth.
4. Install new inlet filter (Part Number IP032901AV) and reassemble cover.

See Service and Maintenance Video for Visual and Audio Instructions (Part Number IP633900AV).

⚠DANGER

Breathable Air Warning

This compressor/pump is not equipped and should not be used "as is" to supply breathing quality air. For any application of air for human consumption, the air compressor/pump will need to be fitted with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification for air, OSHA, ANSI and/or Canadian Standards Associations (CSA).

DISCLAIMER OF WARRANTIES

In the event the compressor is used for the purpose of breathing air application and proper in-line safety and alarm equipment is not simultaneously used, existing warranties shall be voided, and Powerex disclaims any liability whatsoever for any loss, personal injury or damage.

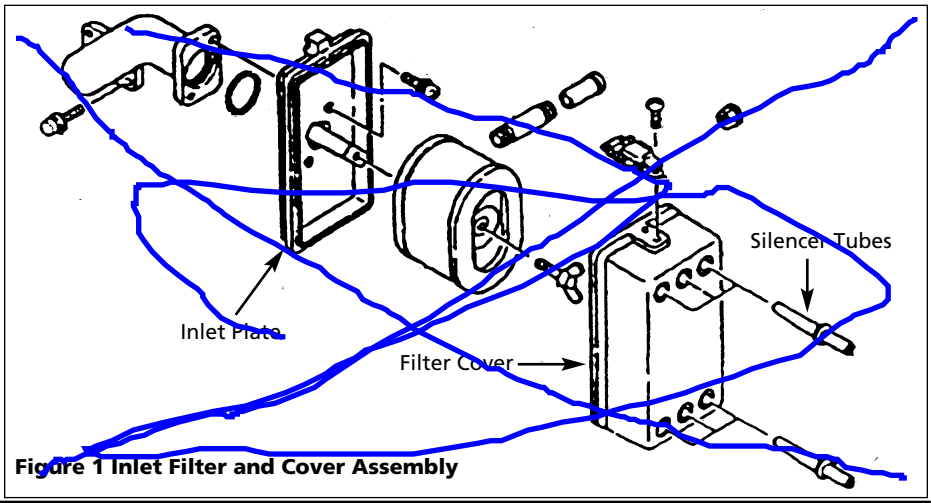


Figure 1 Inlet Filter and Cover Assembly

Grease Compressor Bearings

10,000 HOURS - MAINTENANCE

⚠CAUTION ***This service should be performed by an authorized Powerex Service Center to avoid failure.***

MAIN BEARINGS

1. Remove the plastic dust cap. Use only one of two locations found on the air end (See Figure 2).
2. Rotate the compressor pulley until the grease fitting is visible through the dust cap hole (See Figure 2). This will allow regreasing of the main bearings.
3. Use a grease gun extension adaptor to engage the grease fitting and supply the proper volume of grease as indicated on the grease delivery chart (See Grease Delivery chart below & Figure 2).

⚠CAUTION ***Use only Powerex genuine grease. Pump grease gun before feeding (this eliminates air from the grease passage of the extension adapter. (Complete Grease Kit Part Number IP616200AJ and Grease Tube Part Number IP600000AV).***

GREASING PIN CRANK BEARINGS

4. Replace plastic dust cap.

The bearings on the scroll compressor are regreaseable to allow extended compressor life. Service should be performed every 5,000 hours of operation.

1. Remove the V-Belts and the fan cover.
2. Remove the air end pulley and cooling fan with a gear puller (See Figure 3).
3. Remove the fan duct shroud.
4. Remove the three grease caps. **Do not attempt to loosen or tighten the bolt.**

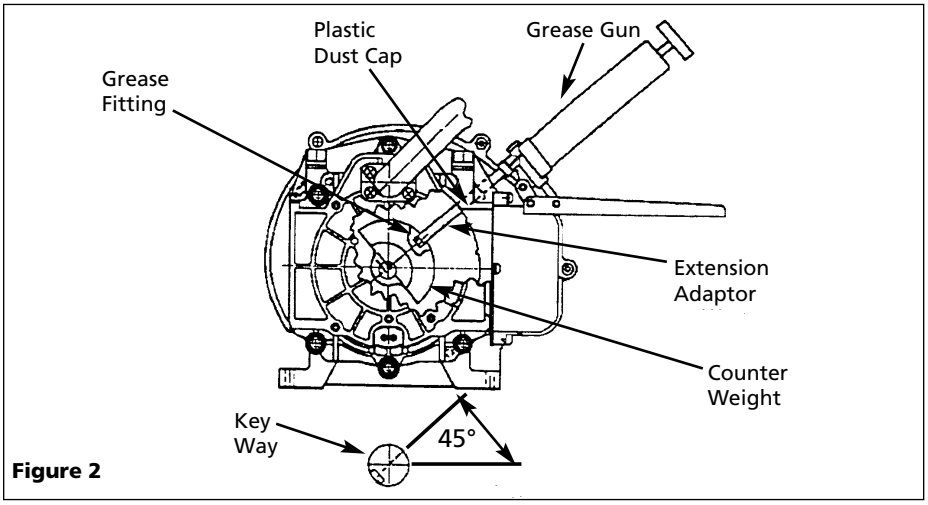


Figure 2

5. Grease all three pin crank bearings (See Figures 3, 4 & 5 and Grease Delivery Chart below).

⚠CAUTION ***The grease fitting, located in the center of the pin crank bearing, feeds only the orbit scroll side bearing. Use a needle adapter to supply grease to the housing side bearing. PUMP GREASE GUN BEFORE FEEDING TO ELIMINATE AIR FROM GREASE PASSAGE OF THE NEEDLE ADAPTER. Hold grease gun for 5 - 10 seconds after feeding to prevent grease blowback from the grease fitting.***

6. Replace grease caps, fan shroud, pulley, etc.

(See Scroll Service and Maintenance Video for Audio and Visual Instructions.)

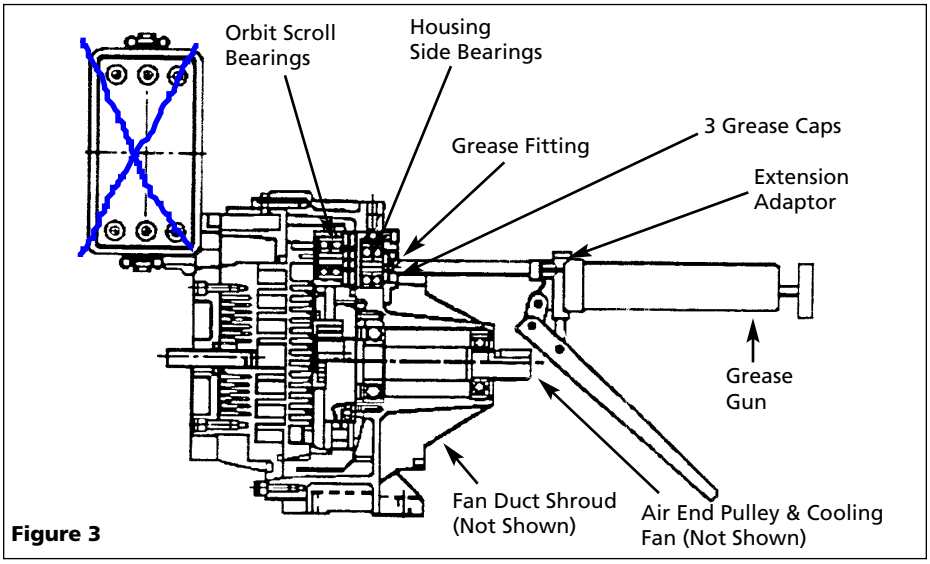


Figure 3

GREASE DELIVERY

Bearing	SLAE03 1st Time	SLAE03 2nd Time	SLAE05 1st Time	SLAE05 2nd Time
Orbit Scroll Bearing	5 Times	3 Times	6 Times	4 Times
Pin Crank Bearing Orbit Scroll Side	5 Times	3 Times	6 Times	4 Times
Pin Crank Bearing Housing Side	5 Times	3 Times	6 Times	4 Times

NOTE: Each pump of the grease gun equals 0.65 grams of grease.

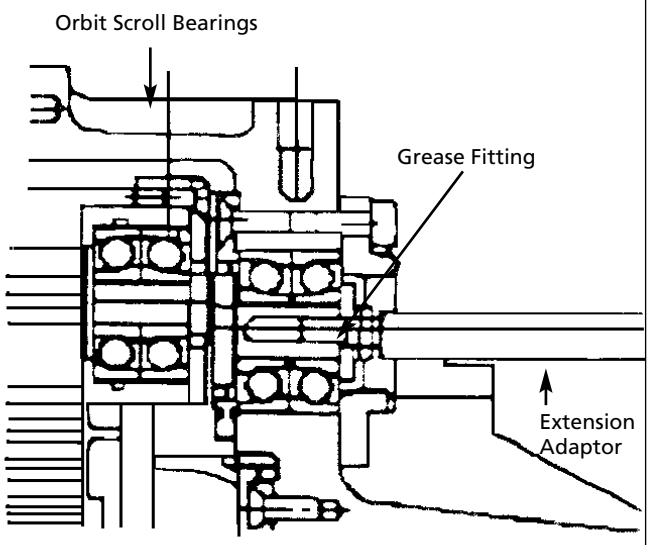


Figure 4

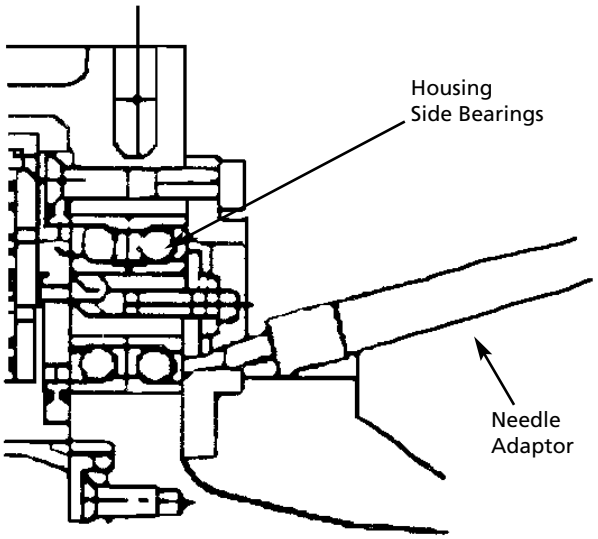


Figure 5

Maintenance Schedule

Item	Action needed	Operating Hours 500	2500	5000	10,000	15,000	20,000	Remarks
Tank	Drain moisture	Daily						
Inlet air filter	Replace	●	▲	*(Every 2,500 hrs or less)*				Part #IP032901AV
Blower fan	Clean			●	●	●	●	
Fan Duct	Clean			●	●	●	●	
Compressor Fins	Clean		●	*(Every 2,500 hrs or less)*				
Bearings	Grease				▲		▲	Service Center Only
Tip seal	Replace				▲		▲	
Dust seal	Replace				▲		▲	
V-belt	Inspect, replace	*Note 3	●	▲	▲	▲	▲	
Pressure switch	Confirm operation				●		●	
Magnetic starter	Inspect				●		●	Replace if contact points deteriorated
Safety valve	Confirm operation		●	*(Every 2,500 hrs or less)*				
Pressure gauge	Inspect		●	*(Every 2,500 hrs or less)*				
●	Inspect							
▲	Replace							

NOTES:

1. Inspect and perform maintenance periodically according to maintenance schedule.
2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
3. * The tension of the V-belt should be adjusted during the initial stage and inspected every 2,500 hours afterwards. Proper belt tension for 3 HP units is 7 lbs./.16" deflection; for 5 HP units, 7 lbs./.19" deflection.
4. See Compressor Pump Manuals for replacement or service procedures.

Tip Seal Set Replacement

10,000 HOURS - MAINTENANCE

The "Tip Seal Set" is a replacement part for SLAE03 and SLAE05 air ends. Please read these instructions thoroughly and carefully to ensure correct replacement.

(See Scroll Service and Maintenance Video for Audio and Visual Instructions.)

Tip Seal Set	SLAE03	SLAE05
Air End Model	3 Hp	5 Hp
Part No.	IP604500AV	IP604600AV

The tip seal on the scroll compressor is self-lubricated and allows the unit to operate efficiently without oil and expensive filtration. The tip seal should be replaced every 10,000 hours of operation.

CONFIRMATION OF THE PARTS

1. Confirm if the tip seal you purchased is correct for the air end you are repairing (See Parts Listing below).

Item No.	Description	Qty.
1	HP tip seal for FS	1
2	LP tip seal for FS	1
3	HP tip seal for OS	1
4	LP tip seal for OS	1
5	Dust Seal	1
6	Backup Tube	1

HP = High Pressure LP = Low Pressure
FS = Fixed Scroll OS = Orbital Scroll

2. Confirm if the following parts are included (See Figure 6).

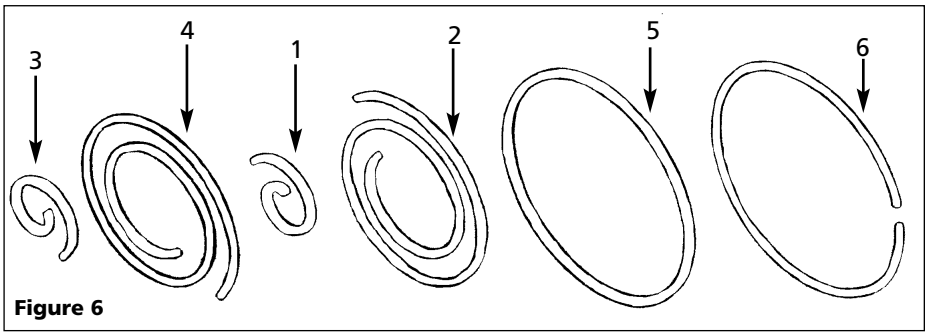


Figure 6

REPLACEMENT

1. Remove six nuts with T-type wrench and then FS set from air end (See Figure 7).
2. Remove LP and HP tip seals from Fixed Scroll set and Orbit set. Using the tip of a ball-point pen at the start will make it much easier (See Figure 7).
3. Remove dust from Scroll with clean cloth or air.

INSERTING TIP SEALS

NOTE: Tips seals for Fixed Scroll and Orbit Scroll have opposing seal cut angels (See NOTE and explanatory diagram below).

Insert tip seal so that the lip of tip seal is on the bottom of seal groove and inner side of involute and the direction of lip faces the center of involute (curving spiral). See Figure 9. This is to be done for both FS and OS sets.

Use caution not to tear or distort lip.

1. Insert new HP tip seal from the center section for OS or Orbit Scroll so that there will be no clearance at the tip (start) section (See Figure 8 and 9).

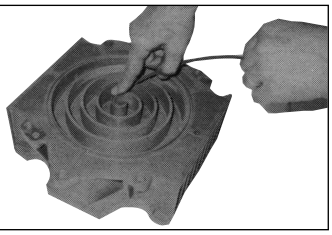
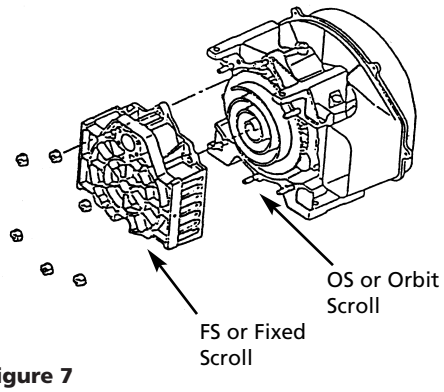


Figure 8



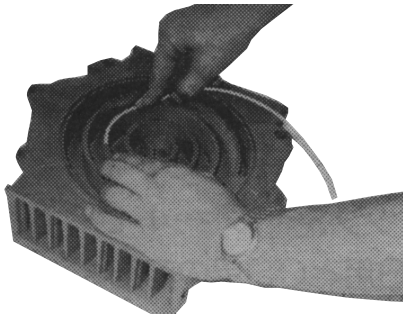
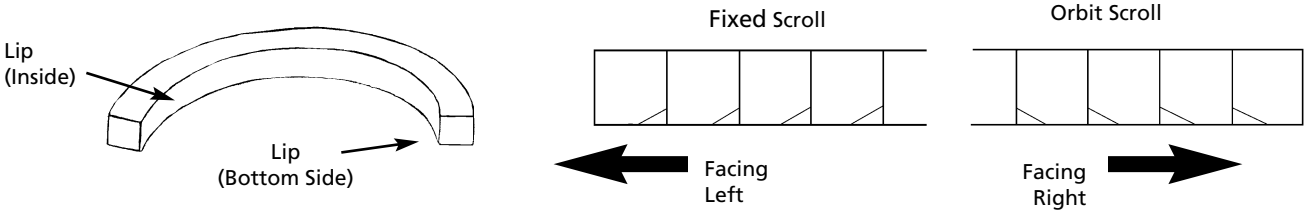

Tip Seal Removal

Figure 7

NOTE: In order to distinguish between the tip seal for Fixed Scroll and the tip seal for Orbit Scroll place the tip seal as shown below then view from the arrow direction and refer to the figure on the right.



Tip Seal Set Replacement (Continued)

2. Insert so that new LP tip seal will contact closely with HP tip seal inside Scroll Groove (See Figure 7 on page 4).

⚠CAUTION ***Insert approximately half of the LP tip seal and remove the tip seal to confirm that a notch in the tip seal has been achieved. This will prevent movement during installation (See Figure 11).***

3. Repeat the same procedure for FS or Fixed Scroll tip seal set, remove both the dust seal and backup tube located on outermost side FS set.
4. Insert new backup tube in the FS Scroll in the 6 o' clock position (See Figure 10).
5. Insert new dust seal on the backup tube. Face seamed section of the dust seal in the 3 o'clock position (See Figure 10).
8. After replacing tip seal set, reassemble Fixed Scroll set to the Orbit Scroll. Tighten 6 nuts temporarily and confirm if crankshaft rotates smoothly by hand and tighten them firmly. Tightening torques are:

Bolt Torque	First	Second
SLAE03	15 in lb.	175 in lb.
SLAE05	15 in lb.	175 in lb.

NOTE: Assemble so that dust seal and tip seal will not drop between Orbit Scroll set and Fixed Scroll set.

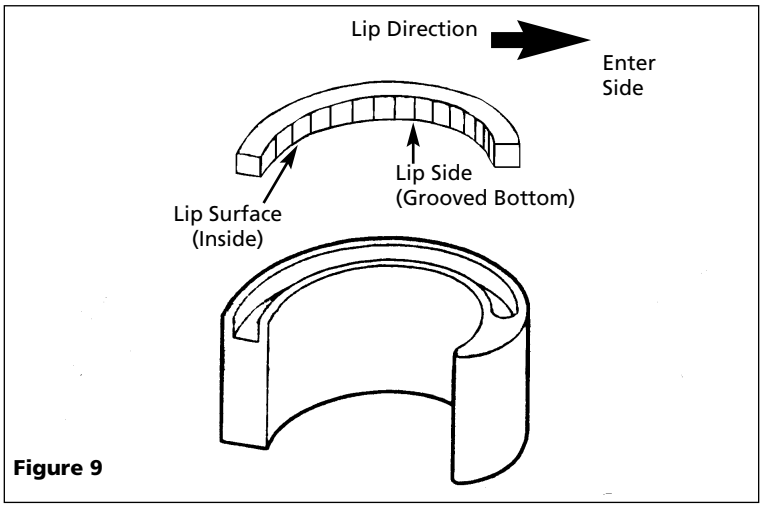


Figure 9

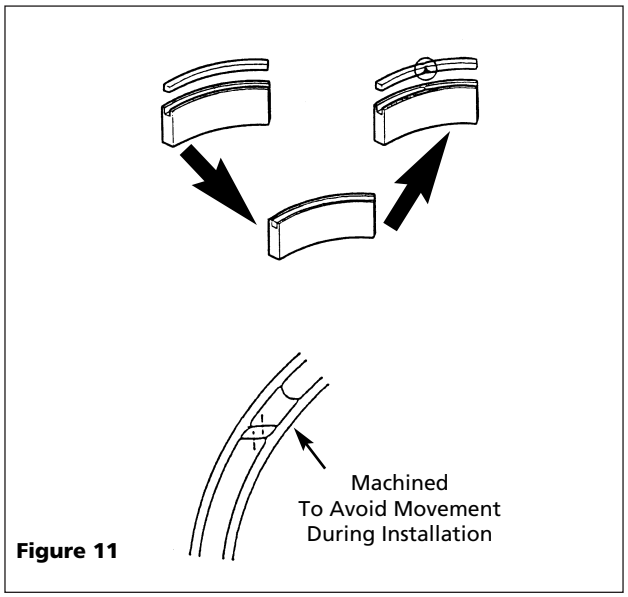


Figure 11

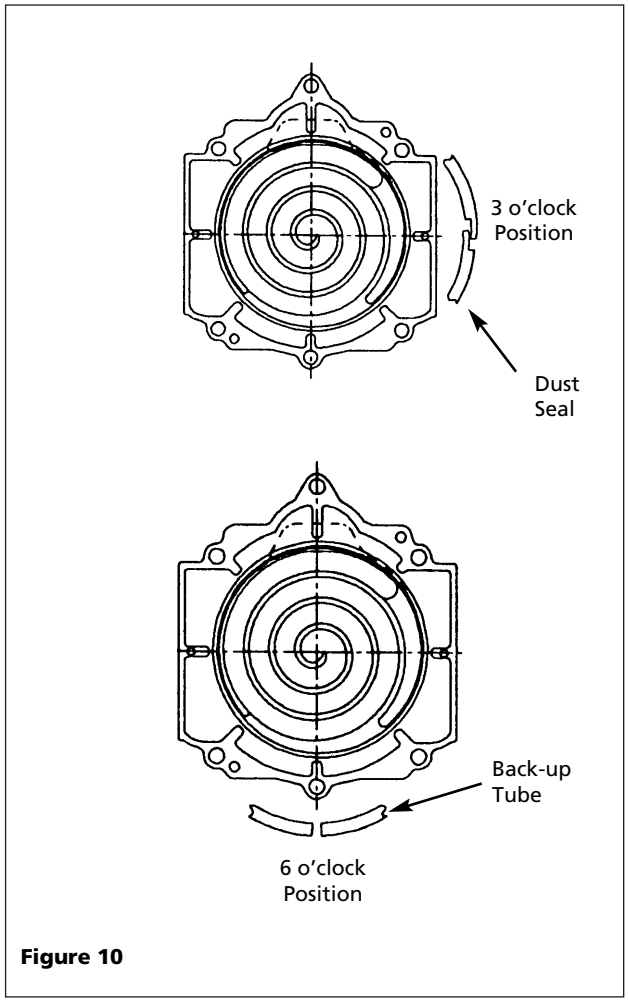


Figure 10

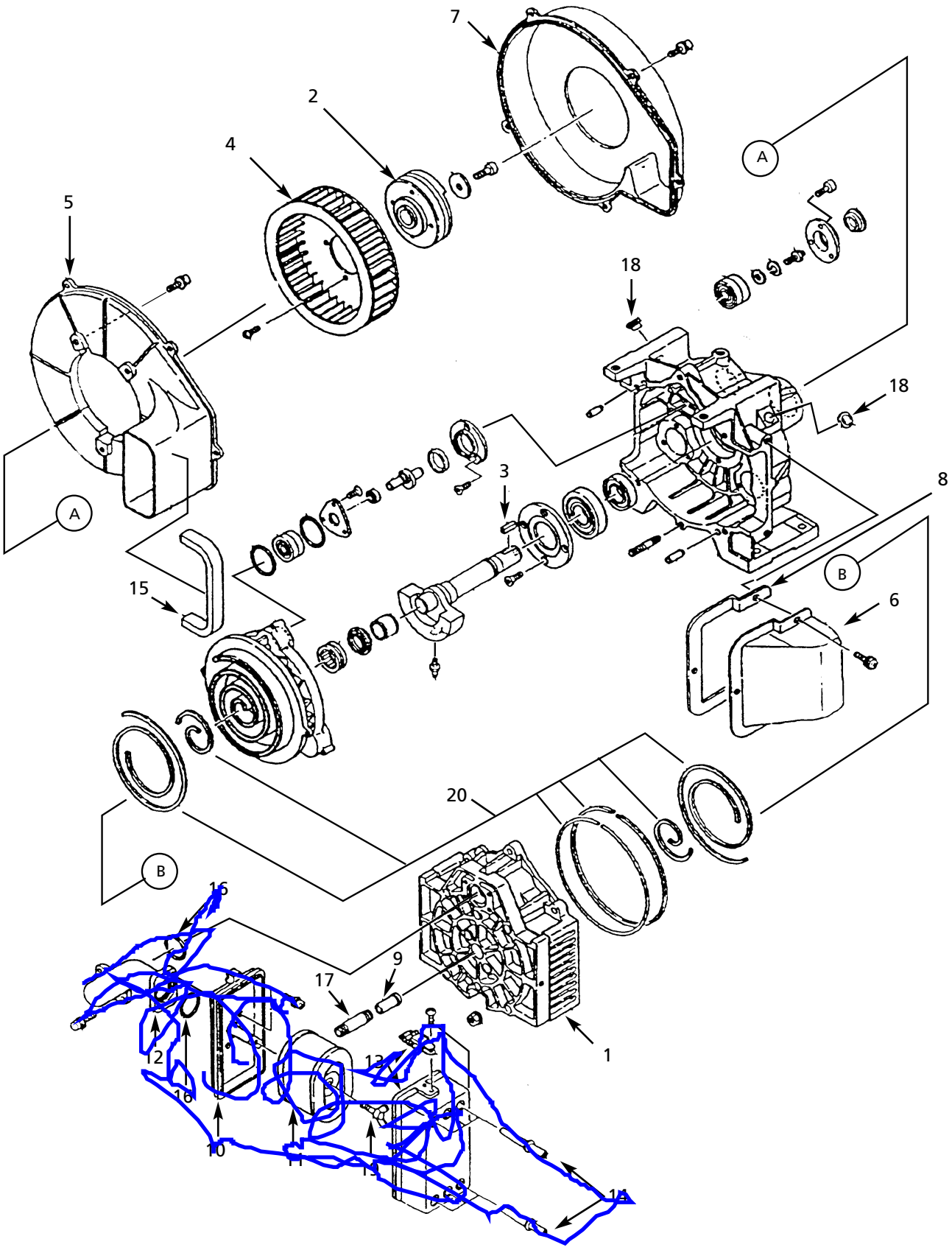


Figure 12 - Compressor Parts

Service Parts List

Ref. No.	Description	Part No. For Models SLAE03	SLAE05	Quantity Per Unit SLAE03	SLAE05
1	Stational Scroll Set	IP600100AV	IP600200AV	1	1
2	Airend Pulley	IP600300AV	IP600400AV	1	1
3	Key	IP600600AV	IP600600AV	1	1
4	Centrifugal Fan	IP601300AV	IP601300AV	1	1
5	Fan Duct (1)	IP601400AV	IP601400AV	1	1
6	Fan Duct (2)	IP601500AV	IP601600AV	1	1
7	Fan Cover	IP601700AV	IP601700AV	1	1
8	Fan Dust Gasket (1)	IP601800AV	IP601900AV	1	1
9	Heat Insulation Pipe	IP602000AV	IP602000AV	1	1
10	Filter Plate	IP602100AV	IP602100AV	1	1
11	Cartridge Filter	IP032901AV	IP032901AV	1	1
12	Intake Pipe	IP602200AV	IP602200AV	1	1
13	Intake Filter Cover	IP016101AV	IP016101AV	1	1
14	Filter Cover Pipe	IP602300AV	IP602300AV	6	6
15	Fan Duct Gasket (2)	IP602400AV	IP602400AV	1	1
16	O-Ring	IP603200AV	IP603200AV	2	2
17	Long Nipple	IP603300AV	IP603300AV	1	1
18	Dust Cap	IP603500AV	IP603500AV	2	2
19	Wing Bolt	IP604200AV	IP604200AV	1	1
20	Tip Seal Set	IP604500AV	IP604600AV	1	1

Powerex Limited Warranty

POWEREX 3 YEAR / 10,000 HOUR EXTENDED PARTS LIMITED WARRANTY - Powerex warrants each Compressor Pump or Scroll Air-End against defects in material or workmanship from the date of purchase for a period of **Three years or 10,000 hours**, whichever may occur first. This warranty applies to the exchange of part(s) of the compressor pump or air-end found to be defective by an Authorized Powerex Service Center.

POWEREX 1 YEAR / 5,000 HOUR INLET TO OUTLET LIMITED WARRANTY - Powerex warrants each Compressor Unit, System, Pump, or Air-End against defects in material or workmanship from the date of purchase for a period of **One Year or 5,000 Hours,** whichever may occur first. This warranty applies to the exchange of defective component part(s) and labor performed by an Authorized Powerex Service Center.

Coverage. The above mentioned warranty applies to Powerex manufactured units or systems only. Items listed in the operator's manual under routine maintenance are not covered by this or any other warranty. Failure to complete maintenance as stated in the maintenance schedule will void this warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE: AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. THIS IS THE EXCLUSIVE REMEDY AND LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES IS EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

Limitation of Liability. To the extent allowable under applicable law, Powerex's liability for consequential and incidental damages is expressly disclaimed. Powerex's liability in all events is limited to, and shall not exceed, the purchase price paid.

Warranty Disclaimer. Powerex has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Product Suitability. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Powerex attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product applications,and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Claims. Claims pertaining to the merchandise in this schedule, with the exception of warranty claims, must be filed with POWEREX within 6 months of the invoice date, or they will not be honored. Prices, discounts and terms are subject to change without notice or as stipulated in specific product quotations. All agreements are contingent upon strikes, accidents, or other causes beyond our control. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of merchandise noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned merchandise will not be accepted without prior written authorization by POWEREX and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THESE TERMS AND CONDITIONS WILL CONTROL IN ANY TRANSACTION WITH POWEREX** any different or conflicting terms as may appear on any order form now or later submitted by the buyer. All orders are subject to acceptance by POWEREX.